B

No. 59—1912.

British Engineering Standards Association.

(*Incorporated 1918.*)

FORMED IN 1901 AS THE ENGINEERING STANDARDS COMMITTEE
BY
THE INSTITUTION OF CIVIL ENGINEERS.
THE INSTITUTION OF MECHANICAL ENGINEERS.
THE INSTITUTION OF NAVAL ARCHITECTS.
THE IRON AND STEEL INSTITUTE.
THE INSTITUTION OF ELECTRICAL ENGINEERS.

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BRITISH STANDARD SPECIFICATION FOR CAST IRON SPIGOT AND SOCKET WASTE AND VENTILATING PIPES FOR OTHER THAN SOIL PURPOSES.

LONDON:
PUBLISHED FOR THE ASSOCIATION BY CROSBY LOCKWOOD & SON,
7, STATIONERS' HALL COURT, LUDGATE HILL, E.C. 4; AND 5, BROADWAY, LONDON, S.W. 1,
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February, 1919.

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BRITISH ENGINEERING STANDARDS ASSOCIATION.

MAIN COMMITTEE.

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MR. C. LE MAISTRE (*Secretary*).

MR. CHARLES DRESSER (*Assistant Secretary*).

* Succeeded the late SIR JOHN WOLFE BARRY, K.C.B., February, 1918.

BRITISH ENGINEERING STANDARDS ASSOCIATION.

The following are lists of Members of the Sectional Committee on Cast Iron Pipes, and of the Sub-Committee on Cast Iron Pipes for Heating, Ventilating and House Drainage which was entrusted with the drafting of the Standard Specification and Designs for Cast Iron Spigot and Socket Waste and Ventilating Pipes.

SECTIONAL COMMITTEE ON CAST IRON PIPES.

August, 1912.

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Crown Agents for the Colonies, Mr. Osbert Chadwick, C.M.G.; Mr. Ashton M. Heath.
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Institution of Municipal & County Engineers, Mr. E. J. Elford; Mr. A. D. Greatorex.
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Cast Iron Pipe Founders' Association of Great Britain, Mr. C. H. Bowser; Mr. F. Chambers; Mr. Cecil A. Cochrane; *Mr. William B. Bryan; Mr. Colin Docwra; *Mr. E. B. Ellington; Mr. W. E. Gray; Mr. George H. Hill; Mr. Ernest Mansergh; Mr. Martin F. Roberts; *Mr. Henry Rofe; Mr. G. Watson.

* Since deceased.

SUB-COMMITTEE ON CAST IRON PIPES FOR HEATING, VENTILATING AND HOUSE DRAINAGE.

August, 1912.

Chairman, Mr. LOUIS F. PEARSON.
Royal Institute of British Architects, Mr. F. T. Reade.
London County Council, Mr. F. S. Capon; Mr. J. E. Worth.
Royal Sanitary Institute, Mr. Edwin T. Hall; Mr. W. C. Tyndale.
Light Castings Association, Mr. John King (*David King & Sons*).
Mr. John Cameron (*Cameron & Roberton, Ltd.*); Mr. C. W. Dawson (*Newton, Chambers & Co., Ltd.*); Mr. W. Jones (*Jones & Attwood*); Mr. Charles Mason (*Foster & Pearson, Ltd.*); Mr. W. McLauchlan (*Walter Macfarlane & Co*); Mr. J. Nelson Russell (*Rosser & Russell, Ltd.*); Mr. A. K. Steven (*McDowall, Steven & Co., Ltd.*).

PREFACE.

The Sectional Committee on Cast Iron Pipes, under the Chairmanship of Mr. Charles Hawksley, was appointed by the Main Committee on October 23rd, 1903, and at their first meeting, held on March 29th, 1904, the following Sub-Committees were formed:—

Name.	*Chairman.*
Cast Iron Pipes for Water, Gas and Sewage	Mr. H. ROFE.
Cast Iron Pipes for Hydraulic Power	Mr. E. B. ELLINGTON.
Cast Iron Pipes for Heating, Ventilating and House Drainage	Mr. LOUIS F. PARSON.

The Specifications for Cast Iron Spigot and Socket Low Pressure Heating Pipes, Report No. 40, and Cast Iron Spigot and Socket Flue or Smoke Pipes, Report No. 41, having been completed, the Sub-Committee on Cast Iron Pipes for Heating, Ventilating and House Drainage next turned their attention to the preparation of Standard Specifications and Standard Designs for Cast Iron Spigot and Socket Soil Pipes and Waste and Ventilating Pipes, and of a suitable series of Standard Fittings for the same.

In presenting the annexed Specification and Designs of Cast Iron Waste and Ventilating Pipes and Fittings, the Sub-Committee desire to call attention to the following points:—

Internal Diameter.—The Sub-Committee are unanimously of opinion that the internal diameter of all pipes and fittings should be the same as the nominal size.

Weight.—One Standard series of Waste and Ventilating Pipes has been drawn up, as the Sub-Committee consider that such a series will best suit the general requirements of Engineers and Architects, and they desire to call attention to the fact that the weights of the pipes given in Table I., while greater in some cases than those given at the present day for the same nominal internal diameters of pipe, are the very lowest weights that can be made in accordance with the Standard dimensions. The Sub-Committee further desire to point out that as these pipes are always sold by length, it has not been deemed necessary to specify a maximum limit of weight, a minimum limit only being required.

Length.—With regard to the Standard lengths of Waste and Ventilating Pipes recommended, the attention of the Sub-Committee has been drawn to the question of making the Standard length, the length in work. While unanimously in agreement with the principle, they desire to point out that it is the general custom in the case of

these pipes to make the nominal length include the socket. In view of this fact they feel that any recommendation with regard to a change in this practice would greatly retard if it did not entirely prevent the adoption of the Standards.

Caulking Space.—With regard to the caulking space in the sockets of pipes from $4\frac{1}{2}$ to 6 inches internal diameter the Sub-Committee are aware that a space of not less than $\frac{3}{8}$ inch is required under the London County Council Drainage By-laws for Pipes of 5 and 6 inches internal diameter, but the Sub-Committee consider that from a practical point of view a caulking space of $\frac{5}{16}$ inch is preferable for these sizes.

The Sub-Committee desire to acknowledge the assistance of the principal Manufacturers who courteously placed at their disposal particulars of the pipes and fittings manufactured by them.

The Report in its present form was approved by the Sectional Committee on Cast Iron Pipes in April, 1912.

This Report was approved by the Main Committee at their meeting held on July 18th, 1912.

NOTE.—*The Association desires to call attention to the fact that this Specification is intended to include the technical provisions necessary for the supply of the material herein referred to, but does not purport to include all the necessary provisions of a Contract.*

BRITISH STANDARD SPECIFICATION FOR CAST IRON SPIGOT AND SOCKET WASTE AND VENTILATING PIPES FOR OTHER THAN SOIL PURPOSES.

Pipes and Fittings.

1. The Pipes and Fittings shall conform in every respect to this Specification and to the Tables hereunto annexed. The spigots and sockets of all Fittings shall conform to the dimensions shown in Table I. for the Straight Pipes. The internal diameter or bore shall in no case be less than the internal diameter given in the Tables. The Fittings shall be of the same thickness and relative weight as the Straight Pipes. A Bend or Branch piece shall be deemed a Right Hand Fitting if, when the body of the Fitting is viewed with the spigot downwards and with the inspection door facing the observer, the socket of the bend or the arm of the branch projects to the right. A Bend or Branch piece shall be deemed a Left Hand Fitting if, when the Fitting is viewed as above, the socket or the arm projects to the left.

Quality of Material.

2. The Pipes and Fittings shall be made from re-melted Iron and the metal shall be dark grey on fracture.

Mode of Casting.

3. The Pipes may be cast horizontally.

Freedom from Defects.

4. The Pipes and Fittings shall be true, smooth, and cylindrical, their inner and outer surfaces being as nearly as may be concentric. They shall be in all respects sound and good castings, free from laps or other imperfections, and shall be neatly dressed and carefully fettled both inside and outside.

Length and Weight.

5. The Straight Pipes shall be made in 6 ft. lengths, which are inclusive to the internal depth of the Socket (Dimension M, Table I.).

The Pipes dealt with in this Specification shall be of not less weight than that specified in Table I. The weight shall be worked to in preference to the outside diameter, which is given approximately to the nearest $\frac{1}{32}$ in. Any Pipe weighing less than the weight given in Table I. shall be liable to rejection.

Marking.

6. Every Pipe and Fitting shall have cast upon it in a legible manner a figure indicating the internal diameter, and also Class Letters "S.V.,"* to indicate the purpose for which the Pipe or Fitting is made, and that it purports to have been manufactured in accordance with the British Standard Specification. In addition to the Class Letters every Pipe and Fitting shall bear the initials or trade mark of the Manufacturer, *e.g.*, 4 S.V. X & Co.

Hammer Test.

7. Every Pipe shall be tested for soundness by being struck all over with a light hand hammer.

Coating.

8. All parts of the interior of Pipes and Fittings shall be galvanised or be coated with Dr. Angus Smith's or other approved composition as may be specified.

If vitreous enamel be used, the coating shall be at least carried over the shoulder of the socket.

Inspection.

9. The Engineer or the Architect or his representative shall have free access to the works of the Manufacturer at all reasonable times; he shall be at liberty to inspect the manufacture at any stage and to reject at the Foundry or subsequently on the site any material, finished Pipe or Fitting that does not conform to the terms of this Specification.

Facilities for Inspection.

10. The Manufacturer shall, at his own cost, supply labour and appliances for such inspection as may be carried out on his premises.

* Standard Ventilating.

BRITISH STANDARD
CAST IRON SPIGOT AND SOCKET
WASTE AND VENTILATING PIPES.

TABLES OF DIMENSIONS.

Table 1. Straight Pipes.
Table 2. Short Radius Bends.
Table 3. Short Radius Bends with Heel Rests.
Table 4. Short Radius Bends with Oval Access Doors.
Table 5. Oval Access Doors.
Table 6. Large Radius Bends.
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Table 19. Holder Bats. Class **A,** Malleable Cast Iron.
Table 20. Holder Bats. Class **B,** Cast Iron.

BRITISH STANDARD
WASTE AND VENTILATING PIPES
AND FITTINGS.

KEY PLAN.

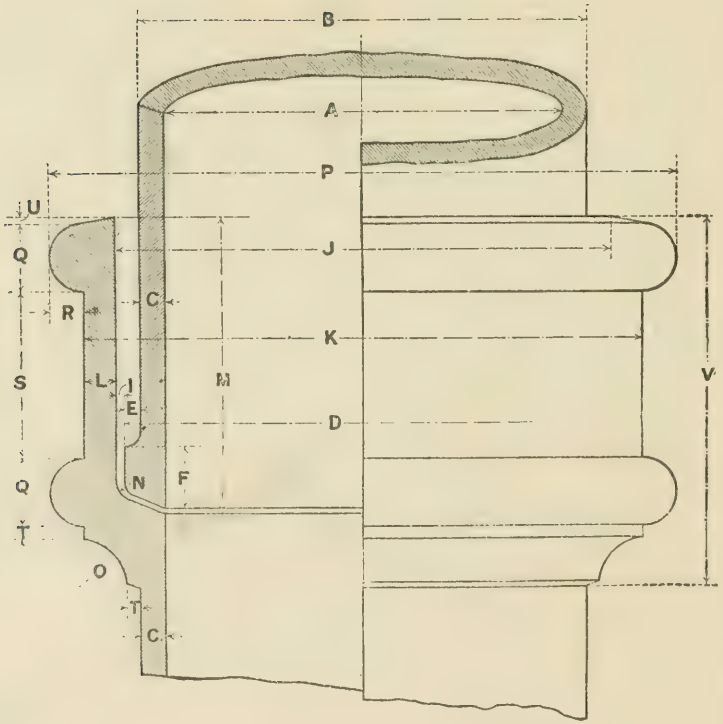


Table I.

BRITISH STANDARD WASTE AND VENTILATING PIPES.

STRAIGHT PIPES.

DIMENSIONS OF PIPES.

PIPE.	**Internal Diameter.**	A	ins. **2**	ins. **2½**	ins. **3**	ins. **3½**	ins. **4**	ins. **4½**	ins. **5**	ins. **6**
PIPE.	Approximate External Diameter	B	2⅜	2⅞	3⅜	3⅞	4⅜	4⅞	5⅜	6⅜
PIPE.	Approximate Thickness	C	3/16	3/16	3/16	3/16	3/16	3/16	3/16	3/16
PIPE.	Diameter of Spigot Band	D	2⅝	3⅜16	3 11/16	4⅜16	4 11/16	5¼	5¾	6¾
PIPE.	Projection of Spigot Band	E	⅛	5/32	5/32	5/32	5/32	3/16	3/16	3/16
PIPE.	Width of Spigot Band	F	½	½	½	⅝	⅝	⅝	⅝	⅝
	Clearance	I	⅛	3/32	3/32	3/32	3/32	⅛	⅛	⅛
	Caulking Space	E + I	¼	¼	¼	¼	¼	5/16	5/16	5/16
SOCKET.	Internal Diameter	J	2⅞	3⅜	3⅞	4⅜	4⅞	5½	6	7
SOCKET.	External Diameter	K	3⅜	3⅞	4⅜	4⅞	5⅜	6	6½	7½
SOCKET.	Thickness	L	¼	¼	¼	¼	¼	¼	¼	¼
SOCKET.	Internal Depth	M	2½	2¾	2¾	3	3	3¼	3¼	3½
SOCKET.	Internal Radius	N	¼	¼	¼	¼	¼	¼	¼	¼
SOCKET.	External Radius	O	½	½	½	½	½	½	½	½
SOCKET.	Diameter over Beads	P	3 15/16	4 7/16	5	5 9/16	6 1/16	6⅝	7¼	8¼
SOCKET.	Width of Beads	Q	9/16	9/16	⅝	11/16	11/16	¾	¾	¾
SOCKET.	Projection of Beads	R	9/32	9/32	5/16	11/32	11/32	⅜	⅜	⅜
SOCKET.	Distance between Beads	S	1 5/16	1 9/16	1 9/16	1 11/16	1 11/16	1 13/16	1 13/16	2 1/16
SOCKET.	Distance of Bead from Edge	T	⅛	⅛	⅛	⅛	⅛	⅛	⅛	⅛
SOCKET.	Taper on End	U	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16
SOCKET.	External Depth	V	3⅛	3⅜	3½	3¾	3¾	4	4	4¼
SOCKET.	Angle at Shoulder of Socket		22½°	22½	22½	22½	22½	22½	22½	22½

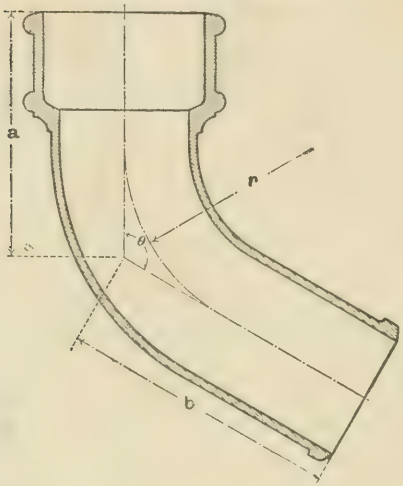
MINIMUM WEIGHTS OF PIPES.

(Overall Length 6 Feet.)

MINIMUM WEIGHT	lbs. 24	lbs. 30	lbs. 35	lbs. 41	lbs. 47	lbs. 54	lbs. 59	lbs. 71

Table 2.

BRITISH STANDARD
WASTE AND VENTILATING PIPES.
SHORT RADIUS BENDS.



$\theta = 92\frac{1}{2}°$

Int. Dia.	2 ins.	2½ ins.	3 ins.	3½ ins.	4 ins.	4½ ins.	5 ins.	6 ins.
a	5¾	6¼	6¾	7¼	7½	8	8¼	9⅛
b	7	7½	8⅝	9⅞	10⅛	10⅝	11⅜	12⅝
r	2⅝	2⅞	3¼	3½	3¾	4	4¼	4⅝

$\theta = 95°$

Int. Dia.	2 ins.	2½ ins.	3 ins.	3½ ins.	4 ins.	4½ ins.	5 ins.	6 ins.
a	5¾	6¼	6¾	7¼	7½	8	8¼	9⅛
b	6⅞	7⅜	8¾	9½	10	10¾	11⅛	12½
r	2¾	3	3¼	3¾	4	4¼	4½	5⅛

$\theta = 100°$

Int. Dia.	2 ins.	2½ ins.	3 ins.	3½ ins.	4 ins.	4½ ins.	5 ins.	6 ins.
a	5¾	6¼	6¾	7¼	7½	8	8¼	9⅛
b	6¾	7¼	8½	9¼	9⅞	10⅜	10⅞	12⅛
r	3	3¼	3⅝	4⅛	4¼	4½	4¾	5⅛

$\theta = 112\frac{1}{2}°$

Int. Dia.	2 ins.	2½ ins.	3 ins.	3½ ins.	4 ins.	4½ ins.	5 ins.	6 ins.
a	5¾	6¼	6¾	7¼	7½	8	8¼	9⅛
b	6¼	6¾	8	8⅝	9	9⅝	10⅛	11¼
r	3¾	4⅛	4⅝	5⅛	5¼	5⅜	6	7

$\theta = 120°$

Int. Dia.	2 ins.	2½ ins.	3 ins.	3½ ins.	4 ins.	4½ ins.	5 ins.	6 ins.
a	5¾	6¼	6¾	7¼	7½	8	8¼	9⅛
b	6	6½	7⅝	8¼	8⅝	9⅜	9¾	10⅞
r	4⅜	4¾	5¼	5⅞	6	6¾	7	8⅛

$\theta = 135°$

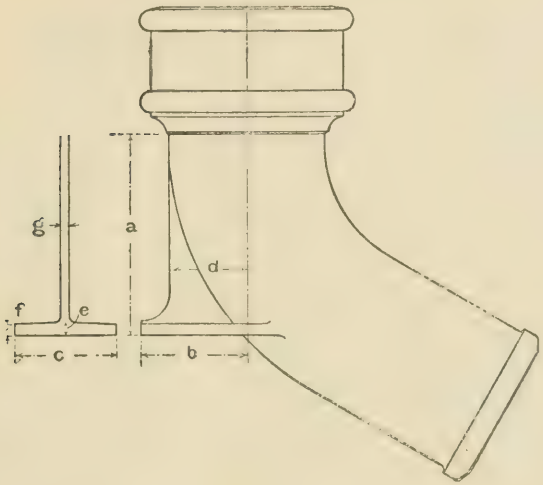
Int. Dia.	2 ins.	2½ ins.	3 ins.	3½ ins.	4 ins.	4½ ins.	5 ins.	6 ins.
a	5¾	6¼	6¾	7¼	7½	8	8¼	9⅛
b	5¾	6	7⅛	7¾	8	8⅝	9	10
r	6	6⅝	7½	8	8½	9½	10	11¼

Spigots and Sockets of Short Radius Bends to be the same as for Straight Pipes of corresponding bore.

Table 3.

BRITISH STANDARD WASTE AND VENTILATING PIPES.

SHORT RADIUS BENDS WITH HEEL RESTS.



Int. Dia.	ins. 2	ins. 2½	ins. 3	ins. 3½	ins. 4	ins. 4½	ins. 5	ins. 6
a	3 3/4	4 1/4	4 7/8	5 3/8	5 7/8	6 1/2	7	8 1/8
b	1 15/16	2 3/16	2 5/16	2 3/4	3	3 5/16	3 9/16	4 1/16
c	1 1/2	1 7/8	2 1/4	2 5/8	3	3 3/8	3 3/4	4 1/2
d	1 3/16	1 7/16	1 11/16	1 15/16	2 3/16	2 7/16	2 11/16	3 3/16
e	1/4	1/4	1/4	1/4	5/16	5/16	5/16	5/16
f	3/16	3/16	3/16	3/16	1/4	1/4	1/4	1/4
g	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4

The dimensions in this Table apply to short Radius Bends of all Standard Angles.

Overall dimensions of Short Radius Bends with Heel Rests to be the same as for the plain Short Radius Bends, Table 2.

Table 4.

BRITISH STANDARD WASTE AND VENTILATING PIPES.

SHORT RADIUS BENDS WITH OVAL ACCESS DOORS

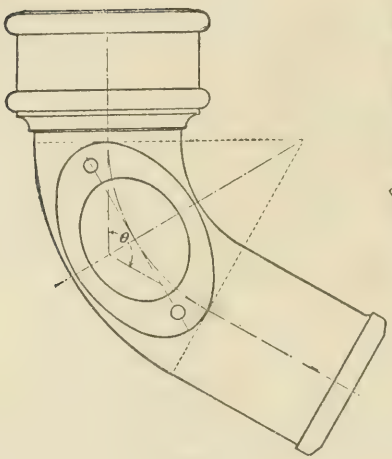


FIG. 1,

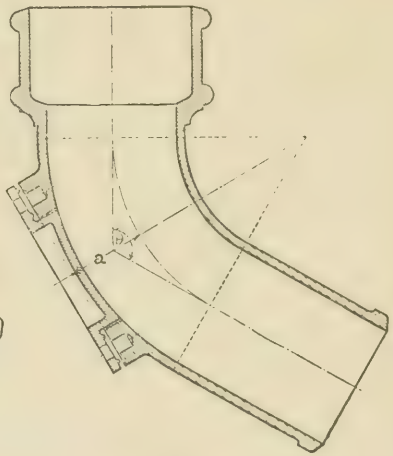


FIG. 2.

DIMENSION a.

Int. Dia.	ins. 2	ins. 2½	ins. 3	ins. 3½	ins. 4	ins. 4½	ins. 5	ins. 6
$\theta = 92\frac{1}{2}$	$1\frac{5}{16}$	$1\frac{1}{2}$	$1\frac{11}{16}$	$1\frac{15}{16}$	$2\frac{3}{16}$	$2\frac{7}{16}$	$2\frac{11}{16}$	$3\frac{1}{4}$
$\theta = 95$	$1\frac{5}{16}$	$1\frac{1}{2}$	$1\frac{11}{16}$	$1\frac{15}{16}$	$2\frac{3}{16}$	$2\frac{7}{16}$	$2\frac{11}{16}$	$3\frac{1}{4}$
$\theta = 100$	$1\frac{3}{8}$	$1\frac{9}{16}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	$3\frac{5}{16}$
$\theta = 112\frac{1}{2}$	$1\frac{5}{16}$	$1\frac{5}{8}$	$1\frac{13}{16}$	$2\frac{1}{16}$	$2\frac{5}{16}$	$2\frac{9}{16}$	$2\frac{13}{16}$	$3\frac{3}{8}$
$\theta = 120$	$1\frac{5}{16}$	$1\frac{11}{16}$	$1\frac{13}{16}$	$2\frac{1}{8}$	$2\frac{3}{8}$	$2\frac{5}{8}$	$2\frac{7}{8}$	$3\frac{3}{8}$
$\theta = 135$	$1\frac{1}{2}$	$1\frac{3}{4}$	$1\frac{15}{16}$	$2\frac{3}{16}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3	$3\frac{1}{2}$

When applied to the side of a Bend, the door is to be placed so that its centre lies on the intersection of the curved centre line of the fitting with the line bisecting the angle of the Bend and its major axis is at right angles to this bisecting line as shown in Fig. 1. The dimensions of the Door and seating are to conform in all respects to the dimensions given in Table 5.

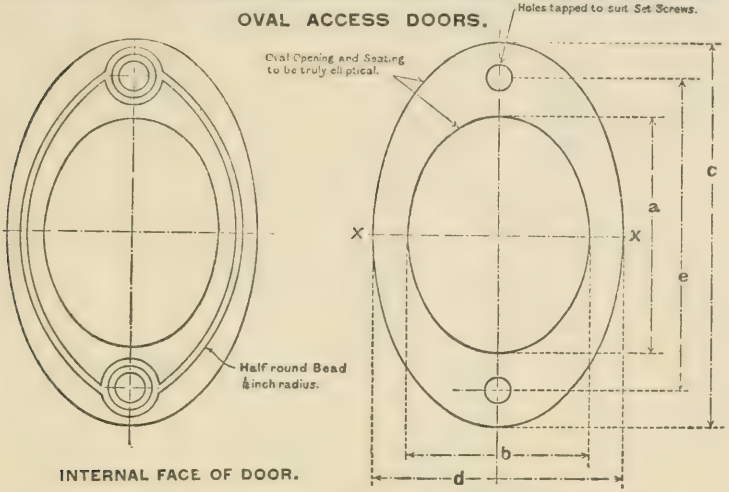
When applied to the heel of a Bend, the door is to be placed so that its centre lies on the line bisecting the angle of the Bend, with its face at right angles to this line as shown in Fig. 2. The face of the seating shall project the distance **a** given in the accompanying Table. With the exception of dimension **f** (Table 5) the Door and seating are to conform in all respects to the dimensions given in Table 5.

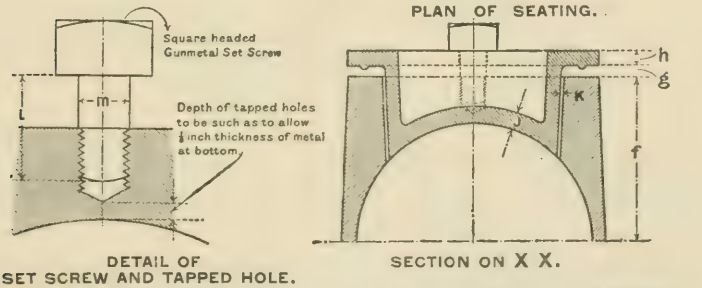
The interior surface of the Door is in all cases to conform to the interior surface of the Bend.

Overall dimensions of Short Radius Bends with Oval Access Doors to be the same as for the plain Short Radius Bends, Table 2.

BRITISH STANDARD WASTE AND VENTILATING PIPES.

OVAL ACCESS DOORS.





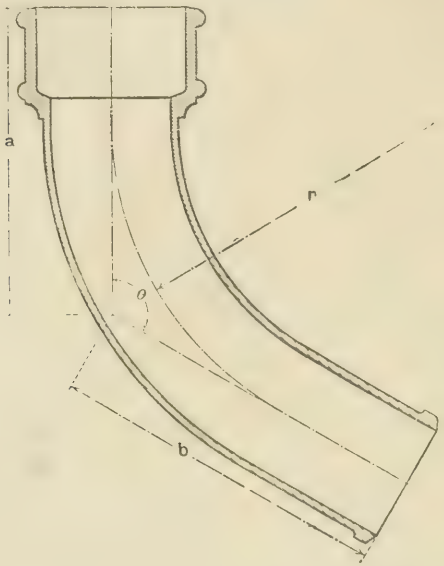
The interior surface of the Door is in all cases to conform to the interior surface of the fitting to which the Door is applied.

Int. Dia. of Pipe.	ins. 2	ins. 2½	ins. 3	ins. 3½	ins. 4	ins. 4½	ins. 5	ins. 6
a	2½	3	3½	3¾	4	4¼	4½	4¾
b	1⅜	1¾	2¼	2¾	3⅛	3½	3¾	3¾
c	4½	5	5½	5¾	6½	6¾	7	7¼
d	2⅛	2⅝	3¼	3¾	4¼	4⅝	5	5
e	3½	4	4½	4¾	5¼	5½	5¾	6
f	1 11/16	1 15/16	2 3/16	2 7/16	2¾	3	3¼	3¾
g	3/16	3/16	3/16	3/16	3/16	3/16	3/16	3/16
h	¼	¼	¼	¼	¼	¼	¼	¼
j	3/16	3/16	3/16	3/16	3/16	3/16	3/16	3/16
k	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16
l	13/16	13/16	13/16	13/16	⅞	⅞	⅞	⅞
m	⅜	⅜	⅜	⅜	7/16	7/16	7/16	7/16

Table 6.

BRITISH STANDARD WASTE AND VENTILATING PIPES.

LARGE RADIUS BENDS.



$\theta = 92\frac{1}{2}°$

Int. Dia.	ins. 2	ins. 2½	ins. 3	ins. 3½	ins. 4	ins. 4½	ins. 5	ins. 6
a	10⅛	10⅞	11	11½	11¾	12¼	12½	13¼
b	11	11¼	11½	11¾	12	12¼	12½	13
r	7¼	7½	7¾	8	8¼	8½	8¾	9¼

$\theta = 95°$

Int. Dia.	ins. 2	ins. 2½	ins. 3	ins. 3½	ins. 4	ins. 4½	ins. 5	ins. 6
a	10	10½	10⅞	11⅜	11⅝	12⅜	12⅝	13
b	11	11¼	11½	11¾	12	12¼	12½	13
r	7½	7¾	8	8¼	8½	8¾	9	9½

$\theta = 100°$

Int. Dia.	ins. 2	ins. 2½	ins. 3	ins. 3½	ins. 4	ins. 4½	ins. 5	ins. 6
a	9⅞	10⅜	10¾	11¼	11½	11¾	12	12¾
b	10¾	11	11¼	11½	11¾	12	12¼	12¾
r	8	8¼	8½	8¾	9	9¼	9½	10

$\theta = 112\frac{1}{2}°$

Int. Dia.	ins. 2	ins. 2½	ins. 3	ins. 3½	ins. 4	ins. 4½	ins. 5	ins. 6
a	9¾	10	10	10½	10½	11	11¼	11¾
b	10½	10¾	11	11¼	11½	11¾	12	12½
r	9¾	9¾	9¾	10	10	10¼	10¾	11

$\theta = 120°$

Int. Dia.	ins. 2	ins. 2½	ins. 3	ins. 3½	ins. 4	ins. 4½	ins. 5	ins. 6
a	9¼	9½	9¾	10	10¼	10½	10¾	11¼
b	10¼	10½	10¾	11	11¼	11½	11¾	12¼
r	10½	10½	10¾	10¾	11	11¼	11½	11¾

$\theta = 135°$

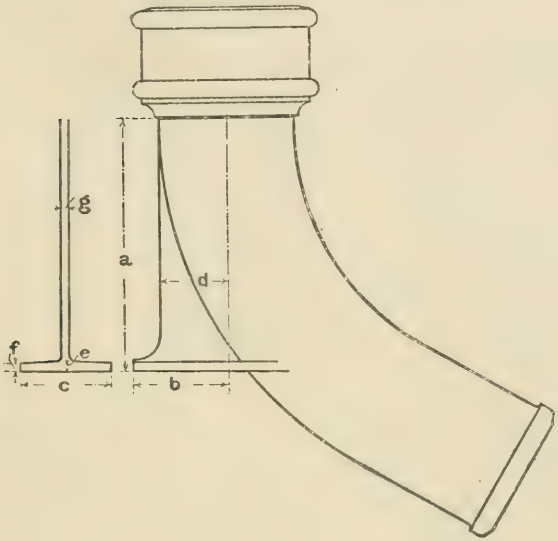
Int. Dia.	ins. 2	ins. 2½	ins. 3	ins. 3½	ins. 4	ins. 4½	ins. 5	ins. 6
a	8¾	9	9	9¼	9¼	9½	9½	9¾
b	9¾	10	10¼	10½	10¾	11	11¼	11¾
r	13	13	13	13	13	13	13	13

Spigots and Sockets of Large Radius Bends to be the same as for Straight Pipes of corresponding bore.

Table 7.

BRITISH STANDARD WASTE AND VENTILATING PIPES.

LARGE RADIUS BENDS WITH HEEL RESTS



Int. dia.	ins. 2	ins. 2½	ins. 3	ins. 3½	ins. 4	ins. 4½	ins. 5	ins. 6
a	7⅞	7⅞	8	8¼	8½	8¾	9	9½
b	1 15/16	2 3/16	2 7/16	2¾	3	3 5/16	3 9/16	4 1/16
c	1½	1⅝	2¼	2⅝	3	3⅜	3¾	4½
d	1 3/16	1 7/16	1 11/16	1 15/16	2 3/16	2 7/16	2 11/16	3 3/16
e	¼	¼	¼	¼	5/16	5/16	5/16	5/16
f	3/16	3/16	3/16	3/16	¼	¼	¼	¼
g	¼	¼	¼	¼	¼	¼	¼	¼

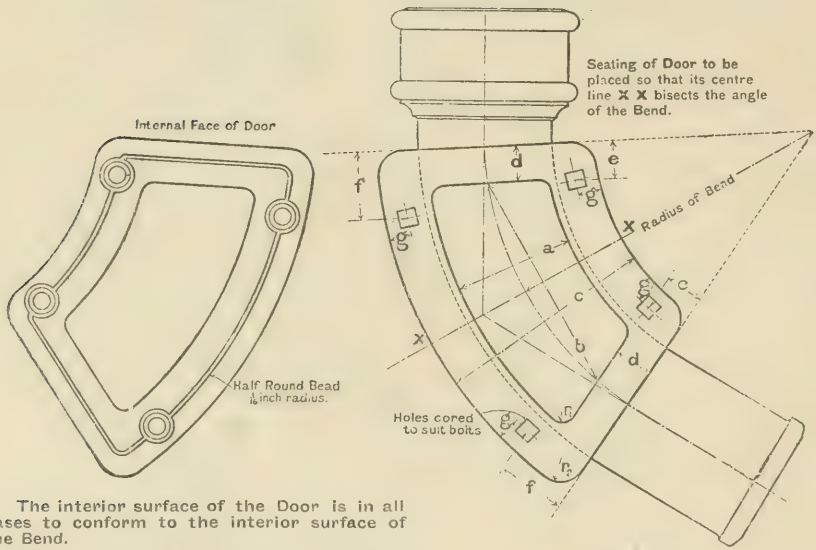
The dimensions in this Table apply to Large Radius Bends of all Standard Angles.

Overall dimensions of Large Radius Bends with Heel Rests to be the same as for the plain Large Radius Bends, Table 6.

Table 8.

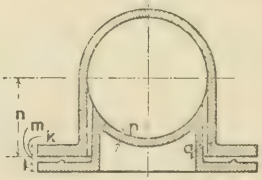
BRITISH STANDARD WASTE AND VENTILATING PIPES.

LARGE RADIUS BENDS WITH INSPECTION DOOR ON SIDE.

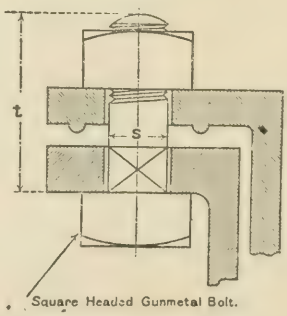

Internal Face of Door
Half Round Bead
1/8 inch radius.
Seating of Door to be placed so that its centre line X X bisects the angle of the Bend.
Radius of Bend
Holes cored to suit bolts

The interior surface of the Door is in all cases to conform to the interior surface of the Bend.

Int. Dia.	ins. 2	ins. 2½	ins. 3	ins. 3½	ins. 4	ins. 4½	ins. 5	ins. 6
a	2	2½	3	3½	4	4½	5	6
b	7½	7½	7½	7½	7½	7½	7½	7½
c	4⅞	5⅜	6⅛	6⅝	7⅛	7⅝	8⅛	9⅛
d	1¼	1¼	1¼	1¼	1¼	1¼	1¼	1¼
e	1¼	1¼	1¼	1¼	1¼	1¼	1¼	1¼
f	2	2	2¼	2¼	2¼	2½	2½	2⅝
g	11/16	11/16	¾	¾	¾	¾	¾	¾
k	5/16	5/16	5/16	5/16	5/16	5/16	5/16	5/16
l	5/16	5/16	5/16	5/16	5/16	5/16	5/16	5/16
m	3/16	3/16	3/16	3/16	3/16	3/16	3/16	3/16
n	1½	1¾	2	2¼	2½	2¾	3	3½
p	3/16	3/16	3/16	3/16	3/16	3/16	3/16	3/16
q	⅛	⅛	⅛	⅛	⅛	⅛	⅛	⅛
r_1	½	½	½	½	½	½	½	½
r_2	⅞	⅞	⅞	⅞	⅞	⅞	⅞	⅞
s	⅜	⅜	7/16	7/16	½	½	½	½
t	1⅜	1⅜	1 1/16	1 7/16	1½	1½	1½	1½



Section through X X.



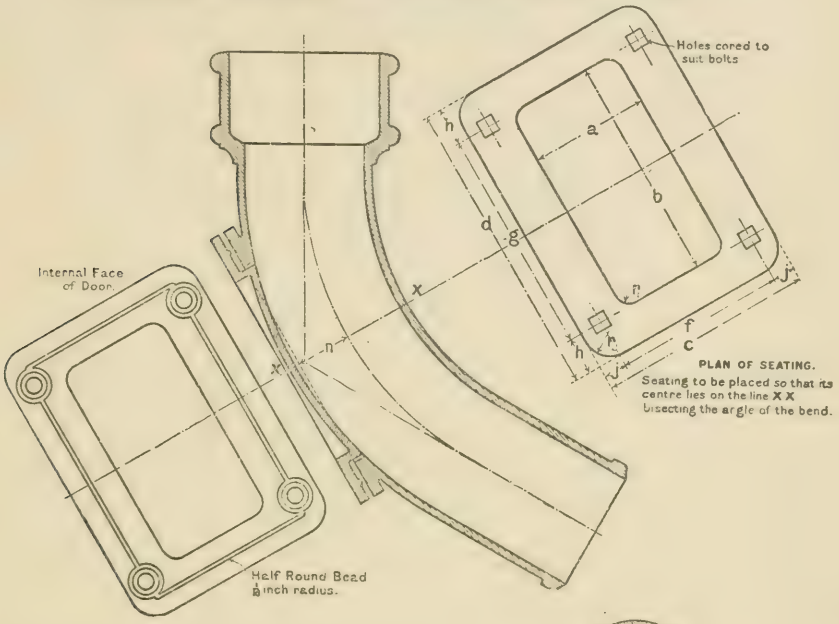
The dimensions given above apply equally to Left Hand Bends.

Overall dimensions of Large Radius Bends with Inspection Doors to be the same as for the plain Large Radius Bends, Table 6.

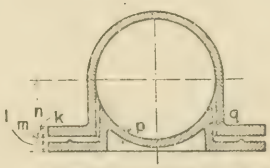
Table 9.

BRITISH STANDARD WASTE AND VENTILATING PIPES.

LARGE RADIUS BENDS WITH INSPECTION DOOR ON HEEL.

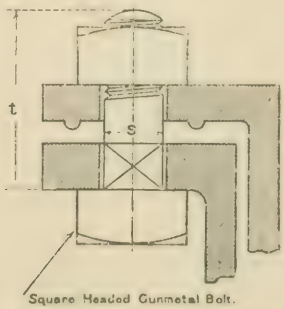

Holes cored to suit bolts
Internal Face of Door
Half Round Bead ⅛ inch radius.
PLAN OF SEATING.
Seating to be placed so that its centre lies on the line X X bisecting the angle of the bend.

Int. Dia.	ins. 2	ins. 2½	ins. 3	ins. 3½	ins. 4	ins. 4½	ins. 5	ins. 6
a	2	2½	3	3½	4	4½	5	6
b	7½	7½	7½	7½	7½	7½	7½	7½
c	4⅞	5⅜	6⅛	6⅞	7⅛	7⅝	8⅛	9⅛
d	10	10	10	10	10	10	10	10
f	3½	4	4⅝	5⅛	5⅝	6⅛	6⅝	7⅝
g	7½	7½	7½	7½	7½	7½	7½	7½
h	1¼	1¼	1¼	1¼	1¼	1¼	1¼	1¼
j	11/16	11/16	¾	¾	¾	¾	¾	¾
k	5/16	5/16	5/16	5/16	5/16	5/16	5/16	5/16
	5/16	5/16	5/16	5/16	5/16	5/16	5/16	5/16
m	3/16	3/16	3/16	3/16	3/16	3/16	3/16	3/16
n	⅞	1⅛	1⅜	1⅝	1⅞	2⅛	2⅝	2⅞
p	3/16	3/16	3/16	3/16	3/16	3/16	3/16	3/16
q	⅛	⅛	⅛	⅛	⅛	⅛	⅛	⅛
r₁	½	½	½	½	½	½	½	½
r₂	⅞	⅞	⅞	⅞	⅞	⅞	⅞	⅞
s	⅜	⅜	7/16	7/16	½	½	½	½
t	1⅜	1⅜	1 7/16	1 7/16	1½	1½	1½	1½



Section through X X.

The interior surface of the Door is in all cases to conform to the interior surface of the Bend.

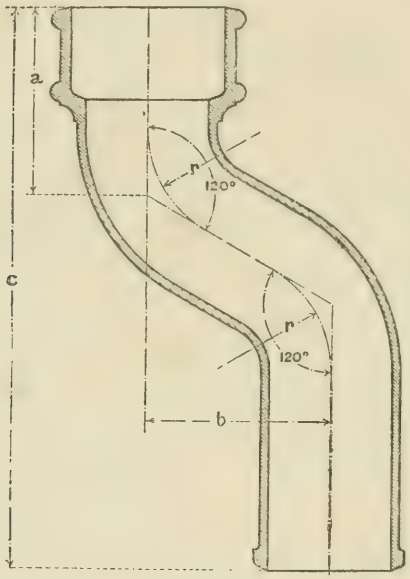


Overall dimensions of Large Radius Bends with Inspection Doors to be the same as for the plain Large Radius Bends, Table 6.

Table 10.

BRITISH STANDARD WASTE AND VENTILATING PIPES.

SWAN NECK BENDS.



Int. Dia.		ins. 2	ins. 2½	ins. 3	ins. 3½	ins. 4	ins. 4	ins. 5	ins. 6
a		4⅞	5¼	5⅝	6	6⅛	6½	6⅝	7¼
r		2¾	3	3¼	3½	3¾	4	4¼	4⅞
b = 3 ins.	**c**	13¾	14½	15	16	16½	17¾	18¼	20
b = 4½ ins.		14½	15½	16	17	17½	18½	19	20¾
b = 6 ins.		15½	16¼	16¾	17¾	18¼	19½	20	21¾
b = 9 ins.		17	18	18½	19½	20	21¼	21¾	23½
b = 12 ins.		18¾	19¾	20¼	21¼	21¾	22¾	23¼	25

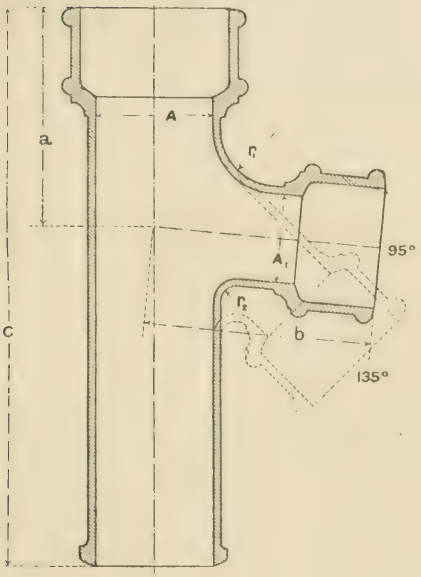
In the case of Fittings in which the projection **b** equals **3** ins. the two radii **r** will be tangential to each other at a point slightly above the sloping centre line of the Fitting, owing to the small projection.

Spigots, and Sockets of Swan Neck Bends to be the same as for Straight Pipes of corresponding bore.

Table II.

BRITISH STANDARD
WASTE AND VENTILATING PIPES.

INVERTED BRANCHES.



95

	ins.	ins.	ins.	ins.	ins.	ins.	ins.
A	**3**	**3½**	**4**	**4**	**6**	**6**	**6**
A_1	**2**	**2**	**2**	**3**	**2**	**3**	**4**
a	6⅞	6⅞	6⅞	7⅜	7½	7½	8½
b	6⅜	7	7½	7⅝	8¼	8⅜	8⅞
c	17⅜	18½	19	19	23½	23½	23½
r_1	2	2	2	2	2	2	2
r_2	½	½	½	½	½	½	½

135

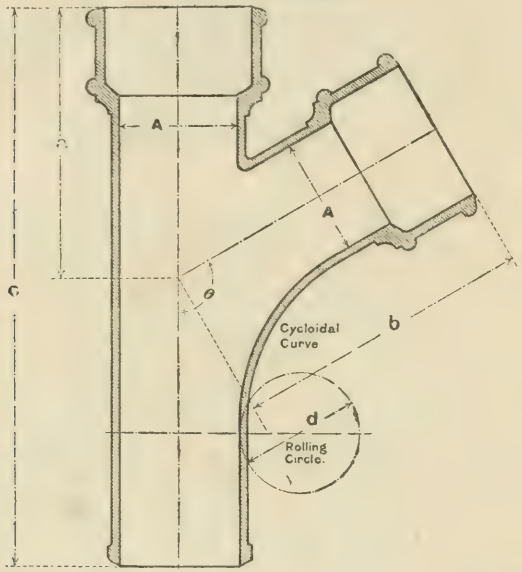
	ins.	ins.	ins.	ins.	ins.	ins.	ins.
A	**3**	**3½**	**4**	**4**	**6**	**6**	**6**
A_1	**2**	**2**	**2**	**3**	**2**	**3**	**4**
a	4⁹⁄₁₆	4⁹⁄₁₆	4⅝	5¹⁄₁₆	3¹³⁄₁₆	4½	5½
b	8⅛	8½	8⅞	9⅝	10¼	11⅛	11⅞
c	17⅜	18½	19	19	23½	23½	23½
r_1	2	2	2	2	2	2	2
r_2	½	½	½	½	½	½	½

Spigots and Sockets of Inverted Branches to be the same as for Straight Pipes of corresponding bore.

Table 12.

BRITISH STANDARD WASTE AND VENTILATING PIPES.

EQUAL BRANCHES.



$\theta = 92\frac{1}{2}°$

	A	a	b	c	d
ins.	2	5 3/16	7 1/4	16 1/4	3
ins.	2 1/2	5 9/16	7 3/4	16 3/4	3
ins.	3	5 7/16	9 1/8	17 3/4	4
ins.	3 1/2	6 3/16	9 5/8	18 1/2	4
ins.	4	6 7/16	9 7/8	19	4
ins.	4 1/2	7 1/16	10 7/8	21	4 1/2
ins.	5	7 3/16	11 5/8	22 1/2	5
ins.	6	8 1/8	12 3/8	23 1/2	5

$\theta = 95°$

	A	a	b	c	d
ins.	2	5 3/8	7 1/4	16 1/4	3
ins.	2 1/2	5 3/4	7 3/4	16 3/4	3
ins.	3	5 11/16	9 1/8	17 3/4	4
ins.	3 1/2	6 7/16	9 5/8	18 1/2	4
ins.	4	6 11/16	9 7/8	19	4
ins.	4 1/2	7 5/16	10 7/8	21	4 1/2
ins.	5	7 1/2	11 5/8	22 1/2	5
ins.	6	8 7/16	12 3/8	23 1/2	5

$\theta = 100°$

	A	a	b	c	d
ins.	2	5 3/4	7 1/4	16 1/4	3
ins.	2 1/2	6 1/8	7 3/4	16 3/4	3
ins.	3	6 5/16	9 1/8	17 3/4	4
ins.	3 1/2	6 15/16	9 5/8	18 1/2	4
ins.	4	7 5/16	9 7/8	19	4
ins.	4 1/2	7 7/8	10 7/8	21	4 1/2
ins.	5	8 1/8	11 5/8	22 1/2	5
ins.	6	9 1/8	12 3/8	23 1/2	5

$\theta = 112\frac{1}{2}°$

	A	a	b	c	d
ins.	2	6 9/16	7 1/4	16 1/4	3
ins.	2 1/2	7	7 7/8	16 3/4	3
ins.	3	7 1/4	9 1/4	17 3/4	4
ins.	3 1/2	8 1/16	9 3/4	18 1/2	4
ins.	4	8 7/16	10 1/8	19	4
ins.	4 1/2	9 1/4	11 1/8	21	4 1/2
ins.	5	9 5/8	11 7/8	22 1/2	5
ins.	6	10 11/16	12 3/4	23 1/2	5

$\theta = 120°$

	A	a	b	c	d
ins.	2	7 1/16	7 3/8	16 1/4	3
ins.	2 1/2	7 1/2	7 7/8	16 3/4	3
ins.	3	7 15/16	9 1/4	17 3/4	4
ins.	3 1/2	8 3/4	9 3/4	18 1/2	4
ins.	4	9 1/8	10 1/8	19	4
ins.	4 1/2	10 1/16	11 1/8	21	4 1/2
ins.	5	10 1/2	11 7/8	22 1/2	5
ins.	6	11 9/16	12 3/4	23 1/2	5

$\theta = 135°$

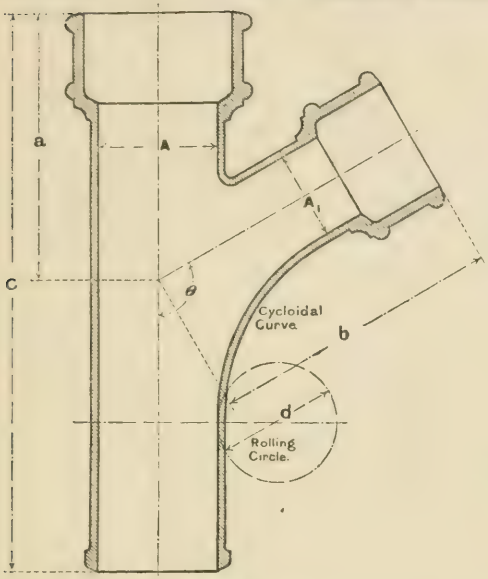
	A	a	b	c	d
ins.	2	8	8	16 1/4	3
ins.	2 1/2	8 1/2	8 1/2	16 3/4	3
ins.	3	9 1/4	9 1/4	17 3/4	4
ins.	3 1/2	10 1/8	10 1/8	18 1/2	4
ins.	4	10 1/2	10 1/2	19	4
ins.	4 1/2	11 3/8	11 3/8	21	4 1/2
ins.	5	12 1/4	12 1/4	22 1/2	5
ins.	6	13 3/8	13 3/8	23 1/2	5

Spigots and Sockets of Equal Branches to be the same as for Straight Pipes of corresponding bore.

Table 13.

BRITISH STANDARD WASTE AND VENTILATING PIPES.

UNEQUAL BRANCHES.



The overall dimensions for Standard Unequal Branches are determined on the following principles—(1) dimension **a** is the same for both Equal and Unequal Branches having bodies of the same internal diameter; (2) the projection of the arm from the outside of the body of the Branch is the same as that on the Standard Equal Branch having the same internal diameter of arm.

Spigots and Sockets of Unequal Branches to be the same as for Straight Pipes of corresponding bore.

$\theta = 92\frac{1}{2}°$

	ins.	ins.	ins.	ins.	ins.	ins.	ins.
A	3½	3½	**4**	**4**	**4**	**5**	**6**
A1	**2**	**3**	**2**	**3**	3½	**4**	**4**
a	6 13/16	6 13/16	6 7/16	6 7/16	6 7/16	7 13/16	8⅛
b	8	9⅜	8¼	9⅝	9⅞	10⅜	10⅞
c	18½	18½	19	19	19	22½	23½
d	3	4	3	4	4	4	4

$\theta = 95°$

	ins.	ins.	ins.	ins.	ns.	ins.	ins.
A	3½	3½	**4**	**4**	**4**	**5**	**6**
A1	**2**	**3**	**2**	**3**	3½	**4**	**4**
a	6 7/16	6 7/16	6 11/16	6 11/16	6 11/16	7½	8 7/16
b	8	9⅜	8¼	9⅝	9⅞	10⅜	10⅞
c	18½	18½	19	19	19	22½	23½
d	3	4	3	4	4	4	4

$\theta = 100°$

	ins.	ins.	ins.	ins.	ins.	ins.	ins.
A	3½	3½	**4**	**4**	**4**	**5**	**6**
A1	**2**	**3**	**2**	**3**	3½	**4**	**4**
a	6 15/16	6 15/16	7 3/16	7 3/16	7 3/16	8⅛	9⅛
b	8	9⅜	8¼	9⅝	9⅞	10⅜	10⅞
c	18½	18½	19	19	19	22½	23½
d	3	4	3	4	4	4	4

$\theta = 112\frac{1}{2}°$

	ins.	ins.	ins.	ins.	ins.	ins.	ins.
A	3½	3½	**4**	**4**	**4**	**5**	**6**
A1	**2**	**3**	**2**	**3**	3½	**4**	**4**
a	8 1/16	8 1/16	8 7/16	8 7/16	8 7/16	9⅝	10 11/16
b	8 3/16	9½	8 5/16	9 13/16	10 1/16	10 11/16	11¼
c	18½	18½	19	19	19	22½	23½
d	3	4	3	4	4	4	4

$\theta = 120°$

	ins.	ins.	ins.	ins.	ins.	ins.	ins.
A	3½	3½	**4**	**4**	**4**	**5**	**6**
A1	**2**	**3**	**2**	**3**	3½	**4**	**4**
a	8 5/16	8¾	9⅛	9⅛	9⅛	10½	11 9/16
b	8¼	9 1/16	8½	9 13/16	10 1/16	10 11/16	11¼
c	18½	18½	19	19	19	22½	23½
d	3	4	3	4	4	4	4

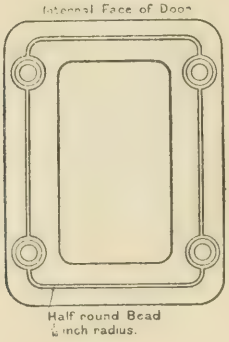
$\theta = 135°$

	ins.	ins.	ins.	ins.	ins.	ins.	ins.
A	3½	3½	**4**	**4**	**4**	**5**	**6**
A1	**2**	**3**	**2**	**3**	3½	**4**	**4**
a	10⅛	10⅛	10½	10½	10½	12¼	13⅜
b	9 1/16	9⅝	9 7/16	9 15/16	10½	11 5/16	11 15/16
c	18½	18½	19	19	19	22½	23½
d	3	4	3	4	4	4	4

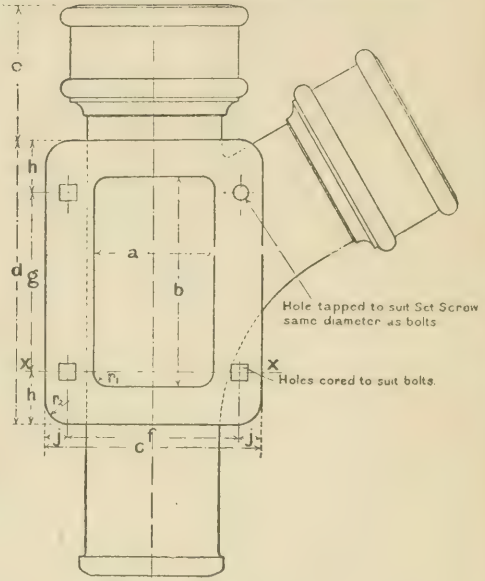
Table 14.

BRITISH STANDARD WASTE AND VENTILATING PIPES.

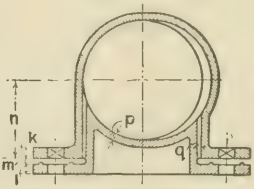
RECTANGULAR INSPECTION DOORS FOR EQUAL AND UNEQUAL BRANCHES.



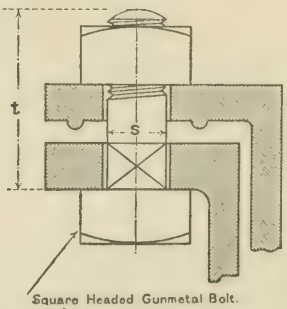
The interior surface of the Door is in all cases to conform to the interior surface of the Branch.



Int. Dia.	ins. 2	ins. 2½	ins. 3	ins. 3½	ins. 4	ins. 4½	ins. 5	ins. 6
a	2	2½	3	3½	4	4½	5	6
b	5	5½	6	6½	7	7¾	8½	10
c	4⅞	5⅜	6⅛	6⅝	7⅛	7⅝	8⅛	9⅛
d	7½	8	8½	9	9½	10¼	11	12½
e	4	4	4¼	4½	4½	5	5¼	5¼
f	3½	4	4⅝	5⅛	5⅝	6⅛	6⅝	7⅝
g	4	4½	5	5½	6	6¾	7½	9
h	1¾	1¾	1¾	1¾	1¾	1¾	1¾	1¾
j	11/16	11/16	¾	¾	¾	¾	¾	¾
k	5/16	5/16	5/16	5/16	5/16	5/16	5/16	5/16
l	5/16	5/16	5/16	5/16	5/16	5/16	5/16	5/16
m	5/16	5/16	5/16	5/16	5/16	5/16	5/16	5/16
n	1½	1¾	2	2¼	2½	2¾	3	3½
p	5/16	5/16	5/16	5/16	5/16	5/16	5/16	5/16
q	⅛	⅛	⅛	⅛	⅛	⅛	⅛	⅛
r_1	½	½	½	½	½	½	½	½
r_2	⅜	⅜	⅜	⅜	⅜	⅜	⅜	⅜
s	⅜	⅜	7/16	7/16	½	½	½	½
t	1⅜	1⅜	1 7/16	1 7/16	1½	1½	1½	1½



Section through X X.

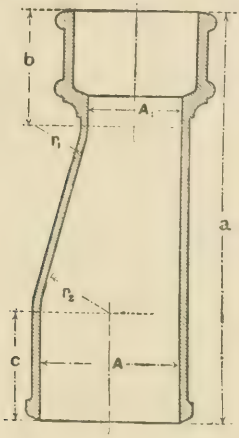


The dimensions given above apply equally to Left Hand Branches. Overall dimensions of Branches with Inspection Doors to be the same as for the Plain Branches, Tables 12 and 13.

Table 15.

BRITISH STANDARD WASTE AND VENTILATING PIPES

DIMINISHING PIECES.



A	ins. **2½**	ins. **3**	ins. **3**	ins. **3½**	ins. **3½**	ins. **3½**	ins. **4**	ins. **4**	ins. **4**	ins. **4**	ins. **4½**	in s. **4½**	ins. **4½**	ins. **4½**
A_1	**2**	**2**	**2½**	**2**	**2½**	**3**	**2**	**2½**	**3**	**3½**	**2**	**2½**	**3**	**3½**
a	13	13	13	13	13	13	13	13	13	13	13	13	13	13
b	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	3⅜	4	3⅜	3⅜	3⅜	4
c	3	3	3	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½	3½
r_1	1⅜	1⅜	1⅜	1⅜	1⅜	1⅜	1⅜	1⅜	1⅜	1⅜	1⅜	1⅜	1⅜	1⅜
r_2	1½	1½	1½	1⅜	1⅜	1⅜	2	2	2	2	2¼	2¼	2¼	2¼

A	ins. **4½**	ins. **5**	ins. **5**	ins. **5**	ins. **5**	ins. **5**	ins. **5**	ins. **6**	ins. **6**	ins. **6**	ins. **6**	ins. **6**	ins. **6**	ins. **6**
A_1	**4**	**2**	**2½**	**3**	**3½**	**4**	**4½**	**2**	**2½**	**3**	**3½**	**4**	**4½**	**5**
a	13	14	14	14	14	14	14	15	15	15	15	15	15	15
b	4	3⅜	3⅜	3¾	4	4	4½	3⅜	3⅜	3¾	4	4	4½	4½
c	3½	3½	3½	3½	3½	3½	3½	3¾	3¾	3¾	3¾	3¾	3¾	3¾
r_1	1¾	1¾	1¾	1¾	1¾	1¾	1¾	1¾	1¾	1¾	1¾	1¾	1¾	1¾
r_2	2½	2½	2½	2½	2½	2½	2½	3	3	3	3	3	3	3

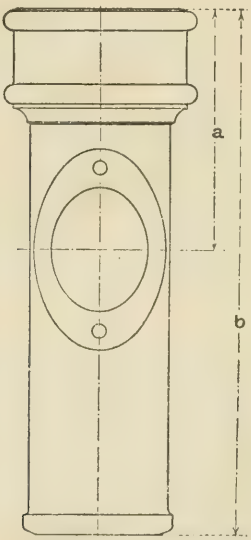
Spigots and Sockets of Diminishing Pieces to be the same as for Straight Pipes of corresponding bore.

Table 16.

BRITISH STANDARD

WASTE AND VENTILATING PIPES.

STRAIGHT INSPECTION PIECES WITH OVAL ACCESS DOORS.



Int Dia	ins **2**	ins. **2½**	ins. **3**	ins. **3½**	ins. **4**	ins. **4½**	ins. **5**	ins. **6**
a	6	6½	7	7⅜	7¾	8⅛	8½	8⅞
b	13¾	14¾	15½	16½	17	17¾	18	18¾

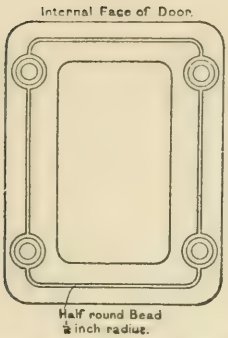
For details of Standard Oval Access Doors, see Table 5.

Spigots and Sockets of Inspection Pieces to be the same as for Straight Pipes of corresponding bore.

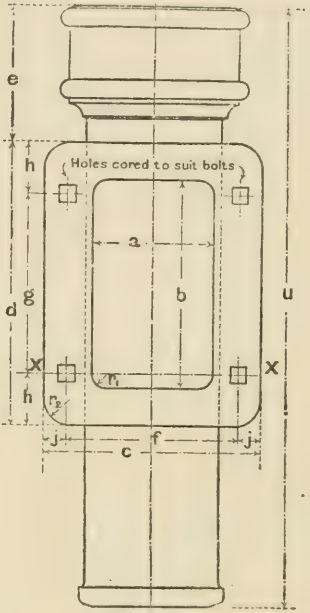
Table 17.

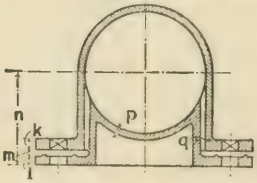
BRITISH STANDARD WASTE AND VENTILATING PIPES.

STRAIGHT INSPECTION PIECES WITH RECTANGULAR DOORS.

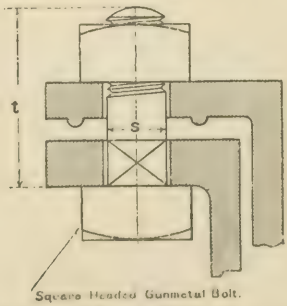


The interior surface of the Door is in all cases to conform to the interior surface of the Pipe.





Section through X X.



Spigots and Sockets of Inspection Pieces to be the same as for Straight Pipes of corresponding bore.

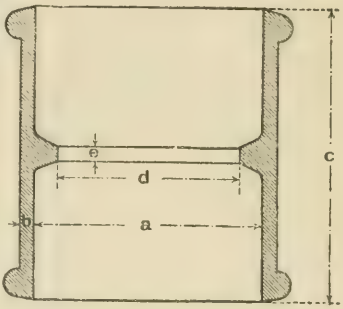
Int. Dia.	ins. 2	ins. 2½	ins. 3	ins. 3½	ins 4	ins. 4½	ins. 5	ins. 6
a	2	2½	3	3½	4	4½	5	6
b	5	5½	6	6½	7	7½	7½	7½
c	4⅞	5⅜	6⅛	6⅝	7⅛	7⅝	8⅛	9⅛
d	7½	8	8½	9	9½	10	10	10
e	4	4	4¼	4½	4½	5	5¼	5¼
f	3½	4	4⅝	5⅛	5⅝	6⅛	6⅝	7⅝
g	4	4½	5	5½	6	6½	6½	6½
h	1¾	1¾	1¾	1¾	1¾	1¾	1¾	1¾
j	1¹⁄₁₆	1¹⁄₁₆	¾	¾	¾	¾	¾	¾
k	⅝	⅝	⅝	⅝	⅝	⅝	⅝	⅝
l	⅝	⅝	⅝	⅝	⅝	⅝	⅝	⅝
m	⅜	⅜	⅜	⅜	⅜	⅜	⅜	⅜
n	1½	1¾	2	2¼	2½	2¾	3	3½
p	⅜	⅜	⅜	⅜	⅜	⅜	⅜	⅜
q	⅛	⅛	⅛	⅛	⅛	⅛	⅛	⅛
r_1	½	½	½	½	½	½	½	½
r_2	⅞	⅞	⅞	⅞	⅞	⅞	⅞	⅞
s	⅜	⅜	7⁄16	7⁄16	½	½	½	½
t	1⅜	1⅜	1⁷⁄₁₆	1⁷⁄₁₆	1½	1½	1½	1½
u	16¼	16¾	17¾	18½	19	21	22½	23½

Table 18.

BRITISH STANDARD WASTE AND VENTILATING PIPES.

DOUBLE SOCKETS.

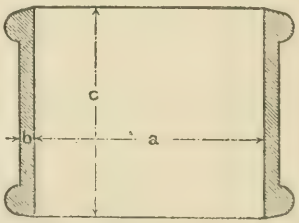
Int. Dia. of Pipe.	ins. 2	ins. 2½	ins. 3	ins. 3½	ins. 4	ins. 4½	ins. 5	ins. 6
a	2⅞	3⅜	3⅞	4⅜	4⅞	5½	6	7
b	¼	¼	¼	¼	¼	¼	¼	¼
c	5 5/16	5 13/16	5 13/16	6 5/16	6 5/16	6 13/16	6 13/16	7 5/16
d	2	2½	3	3½	4	4½	5	6
e	5/16	5/16	5/16	5/16	5/16	5/16	5/16	5/16



Beads and interior dimensions of Double Sockets to be the same as for Sockets of Straight Pipes of corresponding bore.

COLLARS.

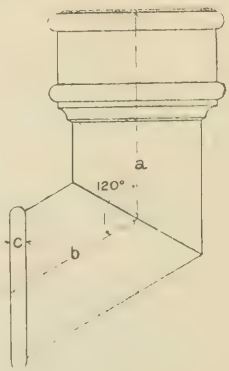
Int. Dia. of Pipe.	ins. 2	ins. 2½	ins. 3	ins. 3½	ins. 4	ins. 4½	ins. 5	ins. 6
a	2⅞	3⅜	3⅞	4⅜	4⅞	5½	6	7
b	¼	¼	¼	¼	¼	¼	¼	¼
c	3¾	4⅛	4⅛	4½	4½	4⅞	4⅞	5¼



Beads on Collars to be the same as beads on Sockets of Straight Pipes of corresponding bore.

SHOES.

Int. Dia.	ins. 2	ins. 2½	ins. 3	ins. 3½	ins. 4	ins. 4½	ins. 5	ins. 6
a	4¾	5⅜	6	6½	7	7⅝	8	9
b	2½	3⅛	3¾	4¼	4⅝	5½	6	7⅛
c	¼	5/16	⅜	5/16	½	½	9/16	⅝

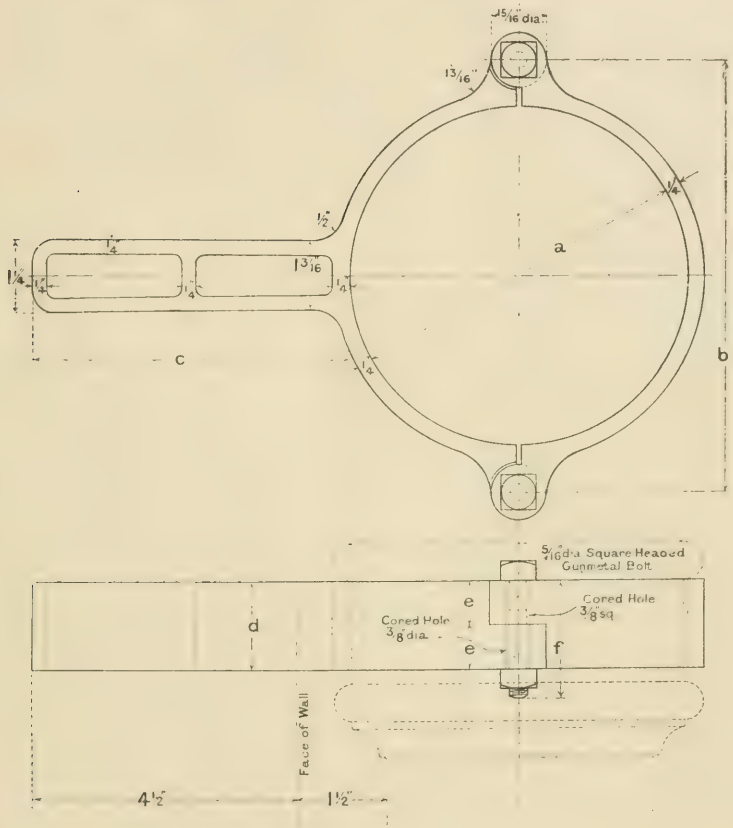


Sockets of Shoes to be the same as for Straight Pipes of corresponding bore.

Table 19.

BRITISH STANDARD WASTE AND VENTILATING PIPES.

HOLDER BATS, CLASS A, MALLEABLE CAST IRON.



Int. Dia. of Pipe	ins. 2	ins. 2 1/2	ins. 3	ins. 3 1/2	ins. 4	ins. 4 1/2	ins. 5	ins. 6
a	3 1/2	4	4 1/2	5	5 1/2	6 1/8	6 5/8	7 5/8
b	5 1/8	5 5/8	6 1/8	6 5/8	7 1/8	7 3/4	8 1/4	9 1/4
c	5 7/16	5 7/16	5 7/16	5 7/16	5 7/16	5 3/8	5 3/8	5 3/8
d	1 1/16	1 5/16	1 5/16	1 7/16	1 7/16	1 9/16	1 9/16	1 13/16
e	17/32	21/32	21/32	23/32	23/32	25/32	25/32	29/32
f	1 5/8	1 7/8	1 7/8	2	2	2 1/8	2 1/8	2 3/8

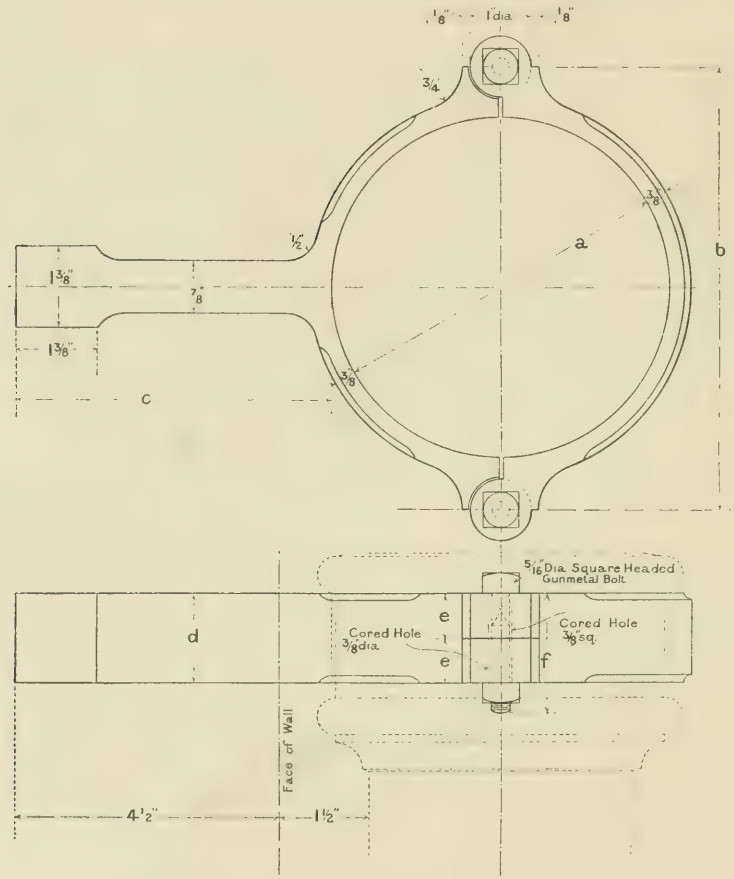
Where circumstances necessitate the Holder Bat being fixed below the socket of the pipe, the bolt holes in the back portion of the Holder Bat must be cast square to enable the bolts to be inserted from below, and dimensions **a**, **b**, and **c** will be modified as follows:—

Int. Dia. of Pipe.	ins. 2	ins. 2 1/2	ins. 3	ins. 3 1/2	ins. 4	ins. 4 1/2	ins. 5	ins. 6
a	2 1/2	3	3 1/2	4	4 1/2	5	5 1/2	6 1/2
b	4 1/8	4 5/8	5 1/8	5 5/8	6 1/8	6 5/8	7 1/8	8 1/8
c	5 15/16	5 15/16	5 15/16	5 15/16	5 15/16	5 15/16	5 15/16	5 15/16

Table 20.

BRITISH STANDARD WASTE AND VENTILATING PIPES.

HOLDER BATS, CLASS B, CAST IRON.



Int. Dia. of Pipe.	ins. 2	ins. 2½	ins. 3	ins. 3½	ins. 4	ins. 4½	ins. 5	ins. 6
a	3½	4	4½	5	5½	6⅛	6⅝	7⅝
b	5¼	5¾	6¼	6¾	7¼	7⅞	8⅜	9⅜
c	5 5/16	5 5/16	5 5/16	5 5/16	5 5/16	5⅜	5⅜	5⅜
d	1 1/16	1 5/16	1 5/16	1 7/16	1 7/16	1 9/16	1 9/16	1 13/16
e	17/32	21/32	21/32	23/32	23/32	25/32	25/32	29/32
f	1⅝	1⅞	1⅞	2	2	2⅛	2⅛	2⅜

Where circumstances necessitate the Holder-Bat being fixed below the socket of the pipe, the bolt holes in the back portion of the Holder Bat must be cast square to enable the bolts to be inserted from below, and dimensions **a, b,** and **c** will be modified as follows:—

Int. Dia. of Pipe.	ins. 2	ins. 2½	ins. 3	ins. 3½	ins. 4	ins. 4½	ins. 5	ins. 6
a	2½	3	3½	4	4½	5	5½	6½
b	4¼	4¾	5¼	5¾	6¼	6¾	7¼	8¼
c	5 5/16	5 5/16	5 5/16	5 5/16	5 5/16	5 5/16	5 5/16	5 5/16

British Engineering Standards Association.

PRICE LIST

OF

BRITISH STANDARD SPECIFICATIONS AND REPORTS.

FEBRUARY, 1919.

(This List cancels all previous Lists.)

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